

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2023
(First Semester)

Branch - APPLIED MICROBIOLOGY

CELL BIOLOGY AND MOLECULAR DYNAMICS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	In eukaryotes, which of the following is not a second messenger? a) 1, 2 – diacyl glycerol b) Cyclic AMP c) Inositol 1, 4, 5 – triphosphate d) cyclins	K2	CO1
	2	Diacylglycerol activates a) protein kinase A b) protein kinase C c) MAP kinase d) tyrosine kinase	K1	CO1
2	3	Heterochromatin is DNA in which form? a) Naked DNA form b) Extended nucleosome form c) Solenoid form D) Looped solenoid form	K1	CO2
	4	Approximately, how many genes do the higher eukaryotes have? a) 10,000 b) 100,000 c) One million d) Ten million	K2	CO2
3	5	On the average, the structural genes in bacteria are how many base pairs long? a) 15 b) 50 c) 100 d) 1000	K1	CO3
	6	In bacteria, which of the following is not an effector? a) cAMP b) L-arabinose c) IPTG d) lactose	K2	CO3
4	7	The maximal rate of protein synthesis in bacterial cells (amino acids per second) is a) approximately, 0.5 b) 3 to 4 c) 12 to 15 d) 30 to 40	K1	CO3
	8	Which of the following amino acids is specified by only a single colon? a) Glutamine b) Tryptophan c) Asparagine d) Isoleucine	K2	CO3
5	9	The corepressor of the tryptophan biosynthetic operon is a a) protein b) tRNA c) cAMP d) tryptophan	K1	CO4
	10	What is the effector for the tryptophan regulatory protein? a) protein b) tRNA c) cAMP d) tryptophan	K2	CO4

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	What is the role of DNA strand breaks in genetic recombination?	K2	CO1
		(OR)		
	11.b.	Contrast the events that occur during cytokinesis in typical plant and animal cell.		
2	12.a.	Describe the factors that contribute to high fidelity of DNA replication.	K2	CO2
		(OR)		
	12.b.	Discuss and interpret the result of Meselson and Stahl experiment.		
3	13.a.	How do RNA Polymerase regulate transcription? Explain in detail.	K3	CO3
		(OR)		
	13.b.	What is the function of each of the controlling sites where regulatory proteins bind in prokaryotic transcription?		
4	14.a.	How do the elongation and termination phases of eukaryotic translation differ from those of prokaryotes?	K3	CO3
		(OR)		
	14.b.	Discuss the inhibitors of translation mechanism in eukaryotes.		
5	15.a.	What is the difference, if any, between structural genes and cistrons in prokaryotes?	K3	CO4
		(OR)		
	15.b.	What proteins normally bind to prokaryotic promoter regions? Explain.		

SECTION - C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Compare the overall roles of mitosis and meiosis in the lives of a plant or animal. How do the nuclei formed by these two processes differ from one another?	K5	CO1
2	17	Elucidate the mechanism of action of DNA polymerases operating on the two template strands and the effect this has on the synthesis of lagging verses the leading strand.	K5	CO2
3	18	Illustrate the post transcriptional process of in eukaryotes.	K4	CO3
4	19	Discuss the properties of genetic code.	K4	CO3
5	20	Discuss the lactose operon.	K4	CO4